the astrogram

VOLUME XV
NUMBER 18
JUNE 7, 1973

National Aeronautics and Space Administration • Ames Research Center, Moffett Field, California

105 days of isolation

Six University of California, Davis, (UCD) students have been isolated from the rest of the world for 105 days. They are part of a joint Ames/UCD isolation experiment which ended May 28 and took place at the Davis campus.

The purpose of the experiment is to study the short and long term effects of isolation and social interaction on human performance and circadian rhythms. Circadian rhythm is the biological pattern of an individual's heartbeat, temperature, respiration, etc., through a 24 hour period.

Drs. Joan Vernikos-Danellis and Charles Winget of the Human Studies Branch are the principal scientist investigators; they are supported by Sonja E. Cronin, Charles W. De Roshia and Anne L. Goodwin, all of the Human Studies Branch. There have been others from all fields at Ames who have participated and cooperated in making the isolation experiment a success.

The results of the experiment will be useful in future space flights such as Space Shuttle. Scientists will use this information to help predict how individuals will respond to lag disruption that space travel entails and how individuals will perform under the physical stress of working and living hundred of miles above Earth.

Dr. Winget says that results of the experiment are also applicable to transcontinental flight and jet lag fatigue.

Six volunteers were divided into two groups of three each. They were put into two identical but physically separate rooms 11' x 17'. Light conditions were controlled by the scientists. The subjects were exposed to either 16 hours light and 8 hours darkness or to 15' candlepower (dusk) continuous light according to predetermined experimental design. No time cues, watches or clocks were allowed.

There was a third "control" group with which investigators compared the first two groups. The three control group volunteers lived in a similar room but were allowed on the lab grounds. They helped prepare meals and do chores.

Each volunteer wore a battery operated telemetry system to monitor the heart rate (EKGs) and body temperature. Various hormone and metabolic changes were measured around the clock. All of the information was electronically

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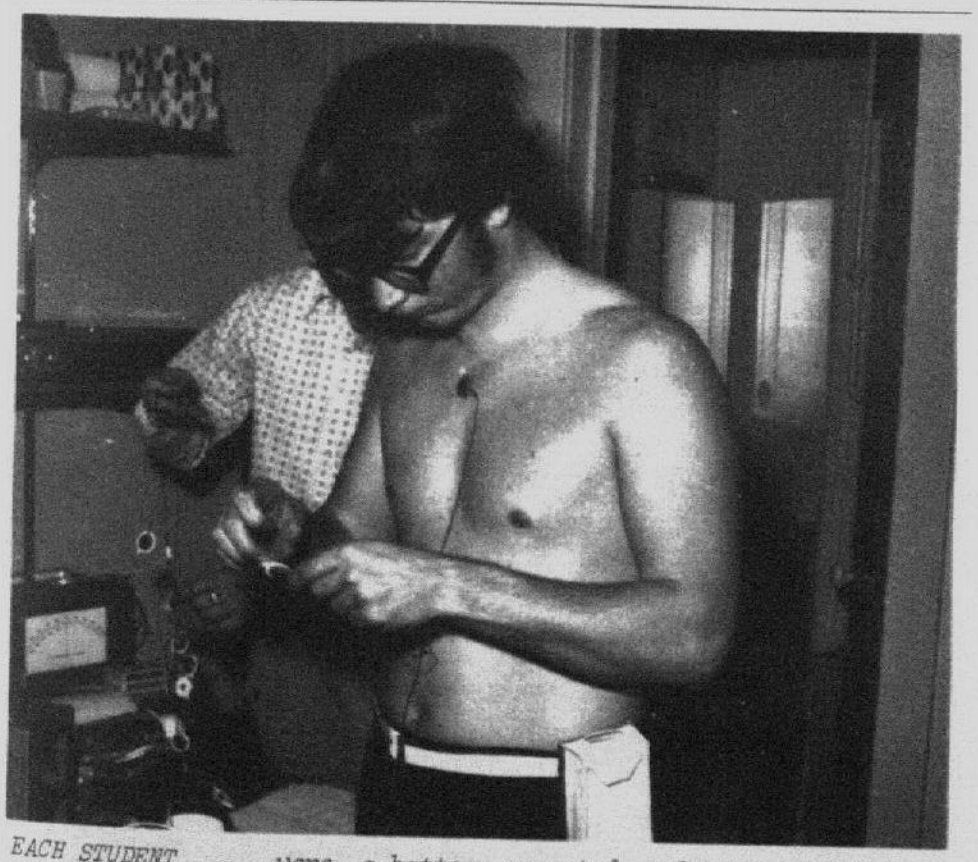

EACH STUDENT . . . wore a battery operated telemetry system such as the one pictured above. The system recorded EKG's and body temperature and was developed at Ames.

Space tools predict fire

One of the oldest threats plaguing life on Earth since time began is now being attacked by the newest of man's tools, space technology.

Instruments developed to sense conditions when fires start easily are being teamed with a satellite relay station and computers to give California Division of Forestry (CDF) a "Fire Index Measurement" from an experimental unmanned remote station in a fire area near Sunol, California.

Foresters say that knowing where fires are probable and how they might act is almost as important as men and equipment actually fighting fires. An unmanned station to establish the fire index in remote areas is doubly important because it gives timely readings which have in the past been made by forestry personnel as only one of their many duties and it has been a problem for them to get the information to their headquarters by telephones. Important too is the idea that when fires occur, forestry personnel are often pulled into firefighting duties and can no longer monitor their areas.

The system is based on sensors developed by the CDF and Ames to check wind velocity and direction, air temperature, relative humidity, and fuel moisture content, a mea-

(Continued on Page 2)

JOHN I. GIEM . . . of Ames Systems Development Branch, adjusts the new unmanned unit that warns foresters when the probability of fire is high.

Pioneer 11 status

Pioneer 11 is now two months out on its 20-month flight to the giant planet Jupiter. All experiments and spacecraft systems are functioning well.

The spacecraft, traveling fast enough to cross the U. S. in about two minutes at 120,000 kilometers per hour (74,000 mph), has covered about one fifth of its billion kilometer (620 million-mile) flight path to Jupiter.

On its course tangent to Earth's orbit, Pioneer 11 has moved almost 48 million kilometers (30 million miles) away from Earth since its launch on April 5, from Kennedy Space Center in Florida.

Meanwhile, its twin, Pioneer 10, launched in March last year and due to arrive at Jupiter next December, has covered 80 percent of its flight path to the giant and brightly-colored ed planet. Pioneer 10 is almost 560 million kilometers (350 million miles) from Earth. Jupiter is still out ahead of Pioneer 10 about 160 million kilometers (100 million

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"Classroom in the Sky"

The California Museum of Science and Industry in conjunction with Ames, presented for a third time "Classroom in the Sky," May 10-15. Students and adults from California flew to Cape Kennedy, Florida to witness the Skylab launch, "the first laboratory for the benefit of mankind." There were 205 participants.

Mike Donahoe, Educational Programs Officer at Ames, accompanied the group to Kennedy Space Center (KSC). The tour coordinator was Sister Clarice Lolich, Director of Education at the California Museum of Science and Industry in Los Angeles.

"Classroom in the Sky" participants included explorer scouts, teachers, professors, business leaders and other community leaders such as Mrs. Irving Stone, wife of the author. All are strong supporters of the space program and wanted to further their knowledge and insight of space in order to help educate others.

(Continued on Page 3)

Space tools

(Continued from Page 1)

sure of the flammability of forest floor litter. Under an agreement between Ames and the Division of Forestry, Ames aerospace technologists have joined the CDF instruments with a NASA "black box" which converts their measurements into data which is beamed to the Earth Resources Technology Satellite (ERTS) four to six times daily.

The ERTS, orbiting Earth every 100 minutes 915 kilometers (540 miles) overhead, picks up the signals with special receiving equipment. The satellite automatically relays the information to a NASA tracking station in the Mojave Desert which passes it along electronically to Goddard Space Flight Center in Maryland. The coded data is sorted out by computer and sent to Ames where it is processed by computer and sent to Forestry headquarters in Sacramento in a useable form.

In the Sunol experiment, the fire index information is passed to Sacramento on a daily basis, but it could be made available within an hour after an ERTS pass if need be.

The sensing unit in the Sunol area has been operating successfully for several weeks and the experiment has been termed by the CDF "highly successful." NASA Ames has assigned a team of experts to study the design of a network of the sensing units which would cover several critical fire areas.

The success of the project is also sparking interest in the possibility of using the system to monitor air pollution.

The fire index project is a good example of a continuing program at Ames to identify problems of public interest and concern and help local agencies find practical sollutions through aerospace technology.

Henry Lum, Jr., research scientist in the Systems Development Branch at Ames is the NASA project manager.

Scientist honored

Dr. Robert T. Jones, Ames Senior Staff Scientist, was elected a fellow of the American Academy of Arts and Sciences at the organization's 193rd annual meeting in May at Boston, Massachusetts.

According to the May 15 issue of the "Stanford Daily" newspaper, Dr. Jones was "among 20 Californians honored with membership in the second oldest learned society in the nation.

STAFF MEMBERS . . . from the Berkeley Executive Seminar Center tour Ames. They include, (from l. to r.): Mary Lepper, Irving Gartner, Gerald Larion, Cradock Bagshaw; Joe Marvin (far right), Chief of the Experimental Fluid Dynamics Branch, guided the group through the 3.5' Hypersonic Wind Tunnel.

Berkeley staff tours Ames

Ames invited the staff members of the Berkeley Executive Seminar Center Program to tour the Center's Flight Simulator for Advanced Aircraft (FSAA), Flight Operations Hangar, 9' x 7' Supersonic Wind Tunnel and 3.5' Hypersonic Wind Tunnel on Wednesday, May 23.

Dave Engelbert, RFE, organized the morning tour. A luncheon was held at "Sakura Gardens" following the tour. All past Ames Berkeley Seminar participants were invited to attend the luncheon.

The visiting seminar staff included Cradock Bagshaw, Irving Gartner, Gerald Larion, and Mary Lepper. All are instructors from colleges and universities around the country who have taken a leave of absence from their respective insitutions to accept a one, two, three or four year appointment from the U. S. Civil Service Commission to teach at the Berkeley Executive Seminar Center.

The Civil Service Commission operates the Berkeley Executive Seminar Center as well as the King Point (New York) Executive Seminar Center and the Oak Ridge (Tennessee) Executive Seminar Center.

The purpose of the executive seminar according to the Commission's manual is "to broaden the conceptual understanding and to enhance the administrative abilities of selected mid-career government executives. It is designed for executives who effectiveness in their present or future roles would be strengthened by an expansion of their views, attitudes, and understandings beyond agency and functional boundaries."

During the past 6 year, over 50 Ames employees have attended the executive seminar two week courses. The courses are open to all Federal Agency employees. Twenty-two seminars are offerred per year. Arrangements for participation in these seminars are handled through the Ames Training Office.

ACE summer schedule

The following ACE television classes begin the week of June 25. Day and time of classes are shown in parenthesis.

Organization and Management, (M. 5 - 7 p. m.)

Principles of Economics, (W. 5-7 p. m.)

Management Planning and Decision Making (W. 5 - 7 p. m.)

Principles of Management Accounting and Finance (T. 5 - 7 p.m.)

Management of Objectives (Th. 5 - 6:30 p. m.)

Conducting Effective Interviews (M. 5 - 6:30 p. m.)

Technical Proposal Writing, (T. 5 - 7 p. m.)

Introduction to Calculus (MW. 12 - 1 p. m.)

Introduction to FORTRAN IV (Th 5 - 7 p. m.)

Effective Reading (TTh 12 - 12:50 p. m.)

Personal Financial Development (MWF. 12 - 1 p. m.)

shorthand Review (TTh 12:15 - 12:45 p. m.)

Practical Transistors (TTh 5 - 5 :45 p. m.)

For further information, contact the Training and Special Programs Branch.

Pioneer 11 status

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miles), and from the spacecraft viewpoint has become the brightest object in the sky except the Sun.

Pioneer 10 continues to return good data from all scientific instruments. It is defining for the first time the interplanetary medium far beyond the orbit of Mars and well past the rocky Asteroid Belt.

Round trip time for radio signals to travel from Earth to Pioneer 11 and back to Earth at the speed of light has stretched out to four and a half minutes. For Pioneer 10, light time for round-trip communications is now an hour and 4 minutes.

Ames controllers have turned on all of Pioneer 11's 12 on-board instruments.

Two instruments, the infrared radiometer and high-field magnetometer, will not be needed until Jupiter is encountered. Flight directors have recently exercised these instruments, however.

Currently, Pioneer 11's solar wind and interplanetary magnetic field instruments are sampling continuously the Sun's field and wind. Four high energy particle experiments are making continuous measurements of solar and galactic-cosmic ray particles. The ultraviolet instrument is measuring hydrogen and helium from interstellar space beyond the solar system, and the meteoroid counters are determining concentrations of these cosmic particles.

AIAA meeting

The American Institute of Aeronautics and Astronautics' (AIAA) June dinner meeting will be held Thursday, June 14, at the Paul Masson Mountain Winery. Wine tasting begins at 6:30 p. m.; dinner is at 7:30 p. m.

For reservation, please call one of the following numbers on or before Friday, June 8:

Ames (Joan)	ext. 6440
Stanford (Andrea)	321-2300
Lockheed (Ann)	742-7539

The astrogram

Room 142
Admin. Mgt. Building
Phone 965-5422

The Astrogram is an official publication of the Ames Research Center, National Aeronautics and Space Administration, Moffett Field, California, and is published bi-weekly in the interest of Ames employees.

Editor . . . . . Meredith Moore
Reporters . . . . . NASA Employees

Deadline for contributions:
Thursday between publication dates

"Classroom in the Sky"

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Cost to the adults was $285; students paid $250. The fee included transportation, tours, housing and some meals.

Before California departure time, intensive briefings and field trips were offerred. Al Worden, SSO, was one of the speakers. Visits to North American Rockwell, McDonnell Douglas and the Jet Propulsion Laboratory were made.

The group flew to Florida via United Airlines. By coincidence, the pilot, Captain Bill Arnot, helped organize the original "Classroom in the Sky" in 1965.

Following arrival in Florida three days before launch, the program called for more speakers and briefings. John C. Hamilton, an 18 year old student from Aiea High School in Aiea, Hawaii spoke on the "Spectrography of Selected Quasars." John was one of twenty-five national winners of the "Student Skylab Contest." Donahoe said he left his listeners flabergasted.

Other speakers included Bill C. Mayes, Program Analyst of the Skylab Program Office at NASA-Marshall Space Flight Center in Huntsville, Alabama, and Fred Durant, Assistant Director of the National Aerospace Science Museum (NASM).

One of the highlights of the trip, according to Donahoe, occurred when former Astronaut R. Walter Cunningham joined the "Classroom in the Sky" tour buses at the Cape. Cunningham spoke and answered hundreds of questons.

KSC bus drivers all conferred that they had never known an astronaut to participate so vigorously in an all day bus tour and informal rap session as Cunningham did for the "Classroom" group. It was indeed an exciting experience.

Cunningham also spoke at a formal banquet on "Space in the 70's and beyond."

A "Classroom in the Sky" program, according to Donahoe, "is one way to update the background of teachers and community leaders as it relates to space researchers.

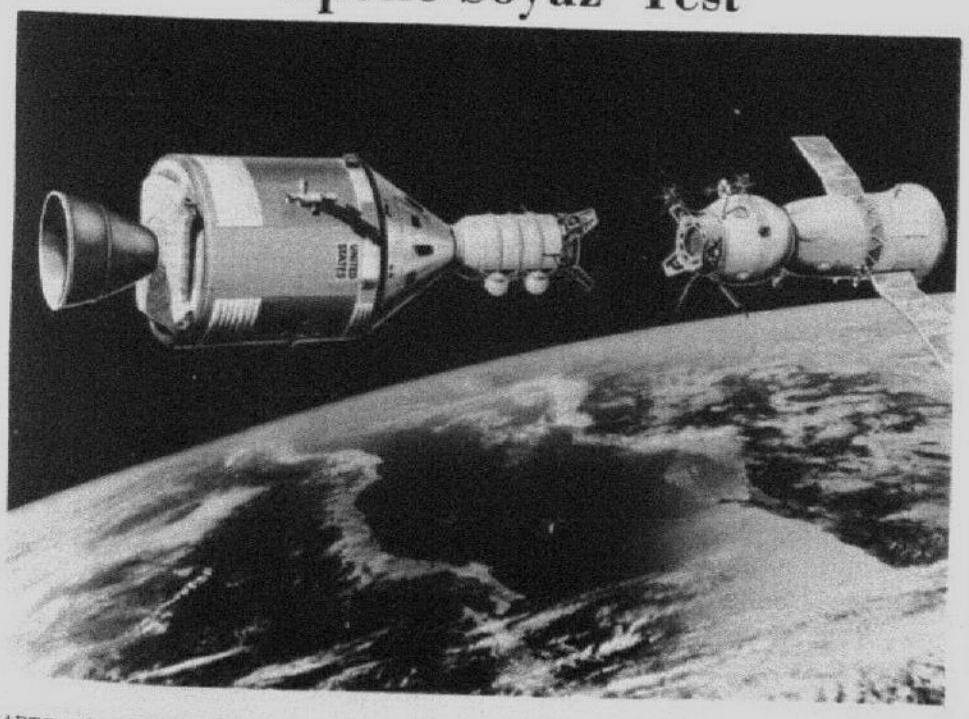
"Many of these people are in the position to influence others and to disseminate correct factual information on a one to one basis.

"In short they multiply the arms and legs of the NASA-Ames Educational Programs Office."

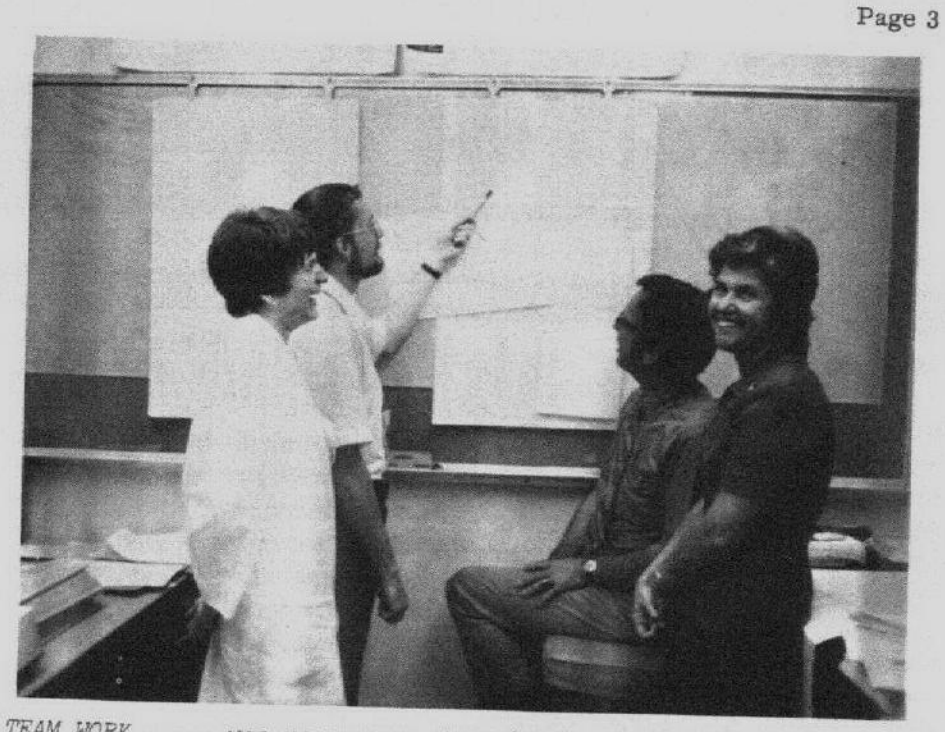
Other methods for dissemination of factual material by Ames Educational Programs office include the Speaker's Bureau, headed by Ms. Barbara Busch, DI, publication and film distribution, and tele-lectures.

Two other "Classroom in the Sky" programs were coordinated with Ames for the May 14 Skylab launch: a Boise State College educational flight group and a joint effort between the three California State Universities at Chico, Fresno and Sacramento. Gary Moen of Ames' Space Science Education Project Office accompanied the former, while Garth A. Hull, Educational Programs Officer, toured with the latter group.

Apollo-Soyuz Test



ARTIST'S CONCEPT . . . of the docking approach of an American Apollo and Russian Soyuz spacecraft in mid 1975. The mission, called Apollo-Soyuz Test Project (ASTP), is designed to test equipment and techniques that will establish international crew rescue capability and for future cooperative scientific exploration.



TEAM WORK . . . was necessary to make the isolated experiment a success. Prime investigators from Ames Human Studies Branch are (l. to r.): Anne L. Goodwin, Charles W. De Roshia, Dr. Charles Winget and Dr. Joan Vernikos-Danellis.

105 days of isolation

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recorded on a graph at half hour intervals and hooked up at Ames by remote data transmission. Graphs were plotted daily to determine performance.

A closed-circuit television viewed the activity in each room. The volunteers could communicate with the experimenters anytime they wished on a voice box. They could watch television (delayed broadcasts), play games and play records.

After three months, the volunteers claimed they were bored. They slept and read a lot. Minor irritations such as cold food or an interrupted television became major inconveniences for the students. Problems magnified in the isolated condition.

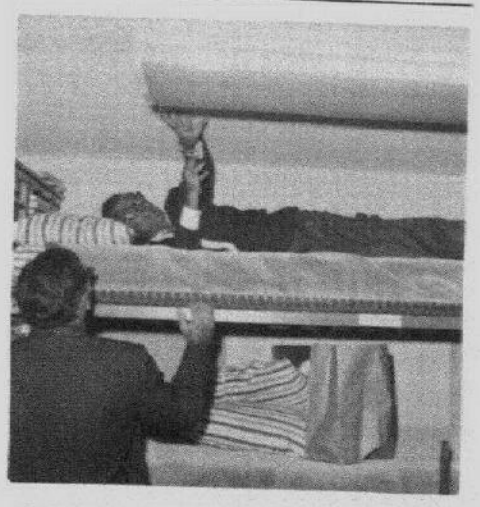
All medical problems were handled remotely; no subject was touched by a physician. The fact that "remote health care" proved to be an efficient method of treatment was an important outcome of the isolation experiment.

Before the experiment began, each volunteer learned how to fly an aircraft simulator. During the experiment, flight operation performance tests were given to the students daily to see how well they could operate the aircraft under the conditions they were being exposed to. Scientists want to know what the performance stress points are within the individual and/or group. The experiment showed that the leader of a group greatly influences the circadian rhythms of the others in the group.

A whole variety of individuals at Ames help make this experiment a success. They were J. Paul Bennett, ATG; Richard F. Claeys, ASM; Frank W. Cleary, Jr., AAST; Thomas B. Fryer, RFD; Doris M. Furman, LR; Navy Captain Walter L. Goldenrath, LR; Peter J. Haro, RSE; Virginia A. Hughes, LRH; Peter Lesak, RSM; Stephen J. Mackin, AAST; Ralph E. Maines, APS; Herbert G. Mallett, ASM; Ralph E. Malloy, RFTM; John F. Pogue, ASM; John M. Rietman, RSM; Dr. Harold Sandler, LR; Phyllis J. Strawbridge, LR; Henry W. Tillman, RFTE; John B. Van Etten, APS; Arthur C. Volkman, AAP; Richard M. Westbrook, RFD; Dr. David L. Winter, L.

The codes represent the following branches and divisions: Electronic Instrument Services Branch, Mechanical Services Section, Photographic Technology Branch, Procurement Division, Property Management Branch, Research Facilities and Instrumentation Division and Security Branch.

UCD investigators included Dr. Loring Chapman, Chairman of Behavioral Biology Department in the Medical School; Dr. John Beljan, Associate Dean for Medical Education; and Dr. Don Rockwell, Asst. Professor of Psychiatry.



RALPH E. MAINES . . . of Ames Security, checks out isolated room for Ames/UCD experiment.

Treadmill test available

Would you buy a used car without test driving it? Probably not. Are you content in the belief that your heart is sound on the basis of resting examination?

There is growing evidence and medical belief that this kind of contentment is neither defendable nor necessary. To this end, the Ames Health Unit Annual Health Survey offered to Ames personnel has been expanded to include a "stress" or treadmill electrocardiograph test (EKG) to reveal early heart disease.

Dr. J. N. Sherwood, Ames Health Unit physician, states that the Health Unit is one of the few clinics in the Bay Area offering routine stress testing to help the individuals within a tightly controlled protocol. Because of personnel limitations, it is only available to the over-forty age group at present. Those with current heart problems are screened out.

The test involves applying small electrodes to various parts on the skin. These pick up the small current coincident with heart contraction which are led to a recording device and monitoring scope and rate indicator. With graded speed and elevation of the treadmill, the pulse rises to a level determined by the American Heart Association standards.

The results are read by Dr. Belson Weinstein, consultant cardiologist, and are available, as are all the periodic exam data, to the patient's own physician.

Early indication of heart or coronary disease may be reversed or slowed by treatment and change of life style. Dr. Sherwood paraphrases the poets, "Absinthe makes the heart grow fonder, but exercise makes it linger longer."

Library surpluses books

Ames Technical Library, Building 202-3, is preparing to surplus books no longer needed in the Library or Branch Library collections.

Before instituting formal surplusing procedures, the staff wants to be certain that all local needs are being met; therefore, the items being surplused will be available for examination by Ames employees. They may select any titles pertinent to their work for retention in offices or laboratories.

Stop by the library between 11:30-4:00 during the week of June 11 and Etta Rosamond or Lesley Whitaker will show employees where the material is on display.

Persons selecting materials are reminded that the material remains government property and may not be appropriated for addition to private libraries or collections.

SOFTBALL

Bob Corbett pitched a 9 to 0 shutout over the Hewlett Packard Warriors in the San Jose Fastpitch Softball League. Bruce Ganzler led the Ames attack with a double and 3-run homer.

BOX SCORE

	AB	R	H	RBI
Kornreich	BS	3	1	2	0
Myers	C	3	1	1	0
Knight	RF	3	1	2	1
Hedlund	CF	2	1	0	0
Scott	SS	2	3	1	2
Olson	3B,LF	2	0	0	0
Ganzler	2B	3	1	2	4
Cygielman	LF	1	0	0	0
Bell	1B	3	0	1	1
Corbett	P	3	1	2	0

JOGGERNEWS

Ten Joggernauts joined over 3,500 enthusiastic joggers on May 20 to run the 63rd Annual Bay-to-Breakers Race, a 7.75 mile race across San Francisco. The Bay-to-Breakers Race is billed as the world's biggest jogger race.

The Joggernaut-ten arrived early Sunday morning only to wait in line to register, be mauled at the start, suffer through the Hayes Street hill, be cursed by San Francisco drivers and freeze in the cold ocean wind, just to cross the finish line.

The finishing places and times (inaccurate, but official) were: Jerry Barrack (420, 50:43); Paul Sebesta (494, 51:49); Vito Daloia (792, 54:20); Bob McCracken (1555, 59:05); Art Mandell (1553, 59:05); George Lenehan (1667, 60:31); Everett Palmer (1686, 60:41); Dale Shute (2000, 63:24, unofficial), Al Bakke (2952, 76:58), and Dave Colburn (3143, 83:56).

Both Al Bakke and Dave Colburn are to be congratulated because this was the first race they had ever ntered. Very well done.

WANT ADS

TRANSPORTATION

FOR SALE

64 Olds,, 4 dr. auto, radio, good trans., $150, call Ragent, 341-3203.

---

65 Austin Healey 3000 MK III, mint cond., o/drive, AM/FM, ex. top, paint, interior, $2250/offer, 323-6511.

---

66 CB77 or 305 Honda motorcycle, very low mileage, very clean, call 738-2931.

---

65 Ford Country Squire Station Wgn. PS,PB, $325, good cond. D. Sharpe, 738-2972.

---

69 Olds, 442, low mileage, new tires, big engine, very clean, air cond., $1600. L. H. Brennwald, 408-354-7795.

---

67 Ford Galaxy 500, A/C, R/H, PB/PS, auto. trans., low mileage, ex. cond., 961-5538.

Plym. Duster, "70" H.p. 340-4 barrel, mags., AT, call betw. 6 & 8 p.m., 264-8338.

---

66 Ford Wagon, 390 V8, good cond. needs paint only, $450/offer, 356-8316.

HOUSING

FOR RENT

New S. Tahoe cabin, 2 ba., sleeps-8, 5 mi. from Stateline, $50 weekend $130 week. Sinnott 225-8043.

N. Tahoe Cottage near lake and private beach area, 984-7238 or 354-1050.

Hawaiian rental, neat vacation cabin on Kauai, $150/week; VW included, 867-0972 eves.

FOR LEASE

1 year, 3 bdrm, 1 1/2 ba, AEK, completely furnished avail. 06-24-73, $250, 264-4627.

MISCELLANEOUS

Battery charger, Sears & Roebuck, 3 ampere, 12 volt, $9 value for $4. 246-2129.

9 x 12 green (avacado) shag area rug (1 mo. old), 246-0372.

RCA 19" portable B/W T.V., hardly used, best offer, 961-5538.

Whirlpool electric dryer, like new, $60, 961-1611.

Franciscan dinnerware, 16 pc.,new, latest design, olive & brown, fact. carton, open stock $40.00, but price is $19.50, 493-5369.

Kelty pack, red nylon bag, expedition model, like new, 739-4443,eves.

Fairbral Swim & Tennis Club membership, $325, 257-7348.

Desk, metal, formica top, 30 x 60, good cond., $35; 968-4624.

H. P. 35 Pocket Computer, new cond, complete $275. Call (408) 258-2831, after 5 p.m.

Ladies English pleasure saddle, Bona Allen Leathers and irons included,$80, 846-6027.

FREE

Kittens, very cute & young, personality plus, 2 blk, 2 striped, contact Meredith Moore, 948-7984. Hurry!

RIDE NEEDED

From So. S. F. near Oyster Pt. turnoff on 101 at Airport Blvd., 8 to 4:30, earlier arrival sat., 589-3563, after 7 p. m.

WANTED TO PURCHASE

Walnut finish AR-2a speaker. D. Gault, 941-7183.

New jogger club

A jogging club for interested Ames employees needs a start.

Women, regardless of age, who are willing to devote a little time to this fun sport are urged to join the jogging club.

Remember, jogging can prove to be very benefificial!

Contact Jennifer Walker or Leslie Gipson, Bldg 203, room 230.

Happenings!

June 12, 11:45 a. m. bldg. N-213, room 261, Ames Sportsmen Club (former Ames Gun Club); urgent business matters and nomination of officers.

****

June 12, 10:30 a.m., bldg. 245, room 215, Professor Francis Kulacki, Dept. of Mechanical Engineering, Ohio State University, "Natural Convection with Volumetric Energy Sources: Stability and Energy Transport in Fluid Layers.

****

June 13, 9 a. m., bldg. 229, room 215 (upstairs conference room), Professor J.D. Walton, Jr., Georgia Institute of Technology, "High Temperature Evaluation of Ceramic Materials."

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VOLUME XV
NUMBER 19
JUNE 21, 1973

National Aeronautics and Space Administration • Ames Research Center, Moffett Field, California

SAM-D MISSILE FIRE SECTION . . . in this artist's concept has missiles in the background remotely located from the radar (center) and weapons control group at left with antenna.

Ames scientist returns from SAM-D missile review

Nick Vojvodich of the Pioneer Venus study team has recently returned to Ames from Washington, D.C. where he was detailed by NASA to serve as a member of the Survey and Investigation Staff of the House Appropriations Committee.

The temporary assignment began on December 4, 1972 and lasted until May 9 of this year. Vojvodich was a member of a four man evaluation team. The team conducted a thorough review of the SAM-D Missile Program.

The SAM-D System, under development for the Army, is basically a ground-to-air missile system using a missile with an advanced semi-active seeker. On the ground, it uses a mobile multi-mode phased array radar with a wide range of target acquisition and tracking capabilities under adverse electronic counter measure conditions.

To meet the stringent system performance and operational requirements, microelectronics with

(Continued on Page 2)

"The Next Billion Years"

Captain Jacques-Yves Cousteau, Dr. Roger Revelle, and Lord Ritchie-Calder are among the twelve speakers to appear in a series of twelve, free public lectures on mankind's next billion years.

The public service series, which began June 19, at 8 p.m. in the Flint Community Center (DeAnza College, Cupertino) and will continue every Tuesday evening through September 11 in Flint Center (except July 3), is sponsored by Ames, San Jose State University, San Francisco State University and the Astronomical Society of the Pacific. People living closer to San Francisco may attend the same series on Mondays at 8 p.m. (except July 2) in the University of San Francisco Memorial Gymnasium, located on Golden Gate Avenue between Masonic and Parker. The first San Francisco lecture was June 18; the lectures continue through September 10.

Ames employees are urged to attend the lectures with family and friends. The series is free to the general public. Lectures can be taken for three units of credit from the California State University campuses noted.

"The Next Billion Years" is a sequel to a program titled "Cosmic Evolution" which was held in San Francisco last summer and drew enthusiastic overflow crowds. Where "Cosmic Evolution" traced life from primordial matter to the

(Continued on Page 2)

NASA Administrator visits Ames

NASA Administrator Dr. James C. Fletcher visited Ames on Friday, June 15 to obtain a first hand look at new Ames programs and to see the progress of the continuing programs at the Center.

Dr. Fletcher was escorted by Dr. Mark, Ames Director, to the C-141 aircraft, an airborne observatory housing a 36" infra-red telescope for airborne astronomy. Dr. Robert Cameron of Ames' Airborne Science Office briefed Dr. Fletcher on the function of the telescope and the three large computers which aid in gathering astronomical information.

In the STOL (Short Take-off and landing)research field, Dr. Fletcher was met by Dr. Leonard Roberts, Director of Aeronautics and Flight Systems, Woody Cook, Chief of V/-STOL Projects Office and Bob Innis, Flight Operations Branch, to inspect the C-8 Augmentor Wing aircraft. Current status and near term plans were discussed.

Dr. Roberts accompanied Dr. Fletcher and Dr. Mark to the Flight and Guidance Simulation Laboratory where VTOL (Vertical Take-Off and Landing) simulation was discussed with George Rathert, Chief of Simulation Sciences Division. Dr. Fletcher and Henry E. "Pete" Clem-

(Continued on Page 2)

GEORGE COOPER . . . Ames pilot, demonstrates the simulated DC-9 aircraft modified for VTOL flight to Dr. James C. Fletcher.

Ames officer participates in recoveries

Larry King, Public Affairs Office, has been Senior Public Affairs Officer for several space missions, including many Mercury shots and all the Apollo missions, beginning with Apollo 10. Tomorrow, June 22, King will participate in the first Skylab recovery 800 miles southwest of San Diego, California at 6:44 a.m. PDT on board the USS Ticonderoga.

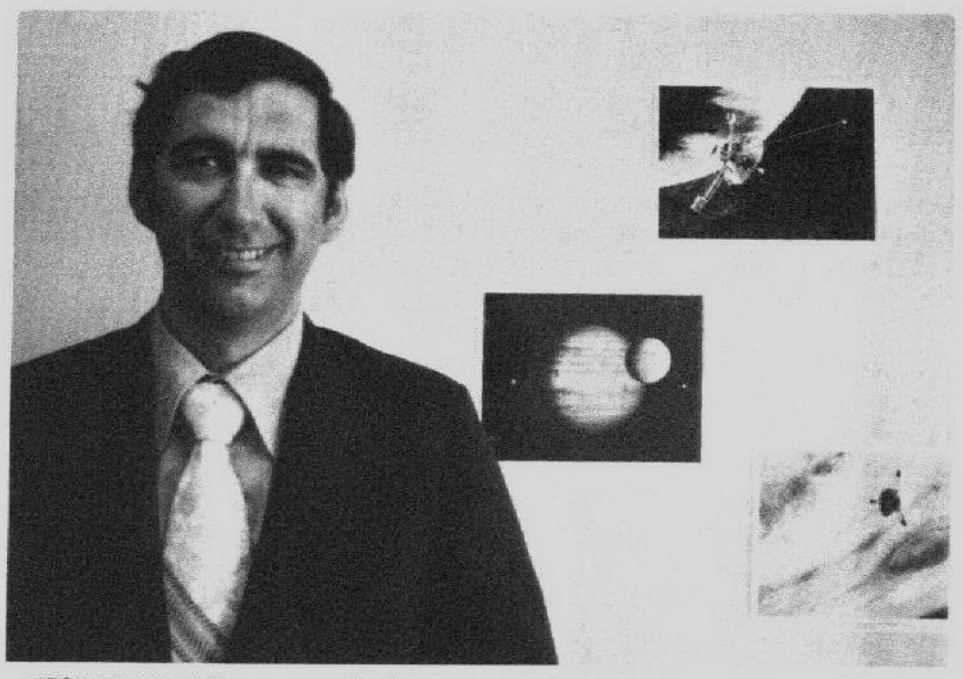
In the capacity of Senior Public Affairs Officer, King supervises the activities of approximately 50 members of a pool which represents all the press, including TV pool set up by three networks, newspaper and wire services.

The TV pool is the largest with thirty people. It is an entire TV organization, including commentator, camera men, producer, director and all technical people. The program is transmitted through satellite hookup back to the U. S. It is released through the Johnson Space Center, (JSC), Houston, Texas.

King assists the newsmen in obtaining the correct information, pictures and coverage they desire. All of the news coverage is available to all forms of communication; there is no exclusive material.

"It is a very complex operation," says King. The recovery

(Continued on Page 3)



NICK VOJVODICH . . . of Pioneer Venus Study Team returns from a temporary appointment in Washington, D. C.

SAM-D missile review

(Continued from Page 1)

an order of magnitude reliability increase and four fold increase in packaging density compared to present military electronics are utilized in the design.

During the course of the review, the evaluation team visited the Project Management Office at U.S. Army Missile Command, Huntsville, Alabama; the prime contractor facilities of Raytheon at Bedford and Andover, Massachusetts; and the sub contractor Martin Mariettá Aerospace at Orlando, Florida.

At each site, comprehensive briefings were presented on various aspects of the system.

The end product of the effort was a sixty page report which was submitted to Congress for their use during the conduct of military appropriations hearings to be held in the year.

The purpose of these intensive reviews is to scrutinize all aspects of the program under investigation to assure that the system objectives are realistic in terms of technical achievement, cost and scheduling.

Vojvodich said the assignment proved to be rewarding in that it provided a valuable insight into the conduct of large, complex military programs. Vojvodich worked closely with people on loan from other Government agencies including G.A.O., F.A.A., F.B.I. as well as NASA Headquarters and NASA Centers.

At the conclusion of the SAM-D Study, Vojvodich was asked to participate in the evaluation of the Air Force A-X Close Air Support Program which is currently in the prototype stage of development at Fairchild Industries, Republic Division, Farmingdale, New York.

In addition to his special assignment, which was carried out in the Pentagon, he presented a paper on Space Shuttle Thermal Protection System (T.P.S.) evaluation at the 14th AIAA/ASME/SAE Structures, Structural Dynamics and Materials Conference which was held in colonial Williamsburg on March 20.

The entire Vojvodich family (wife Helen and four daughters) traveled to Washington, D.C. They rented a house in Virginia and spent the majority of weekends sightseeing in the Washington, D.C. area.

Two highlights were attendance at the Presidential Inauguration Ceremony and a tour of the Russian collection of the Post-Impressionist French paintings on temporary exhibit at the National Gallery of Art.

The return trip across country by car carried the Vojvodich family through the Badlands and Blackhills of South Dakota as well as Yellowstone Park.

Vojvodich summed up the trip: "It was a memorable experience for the entire family but we're all happy to be back in California."

Ames receives award from FPC

Ames received a special recognition award from the Federal Personnel Council (FPC) of Northern California on May 24.

The certificate, signed by C.H. Woodbury, Chairman of FPC, read "In special recognition for interest in today's youth and tomorrow's leaders."

Ames Equal Employment Opportunity Office, headed by Willie L. White, Jr., administers six youth programs and is currently in the process of hiring one hundred and twenty summer students.

"The Next Billion Years"

(Continued from Page 1)

present, "The Next Billion Years" will focus upon the interrelations of universe, life, and mind in the near and far-distant future.

The next lecture will be June 26. The speaker is Dr. Allan Sandage, a staff member of Hale Observatories (Mt. Wilson and Palomar), is one of the world's foremost astronomers. Dr. Sandage will discuss "Cosmic Evolution: Stars, Galaxies and the Universe," a topic on the history of cosmic matter from birth through the formation of galaxies, stars and planets and speculation on the Earth's future.

In order of appearance, the succeeding weekly presentations are as follows:

EVOLUTION OF EARTH'S BIOSPHERE, Dr. J. William Schopf, Professor of Geology, University of California, Los Angeles;
THE POPULATION BLOOM, Dr. Roger Revelle, Director, Center for Population Studies, Harvard University;
DESIGNING RESOURCE CONSERVING CITIES, Dr. Richard Meier, Prof. of Environmental Design, University of California, Berkeley;
ENERGY AND RESOURCES: The Future of Human Society in a Finite World, Dr. William Cooper, Prof. of Zoology, Michigan State University;
AN ARTIFICIAL OCEAN FOR AN ARTIFICIAL PLANET, Captain Jacques-Yves Cousteau, Explorer.
INTELLIGENT MACHINES: Partner or Master? Dr. Michael Arbib, Chairman, Computer Science, and Prof. of Psychology, University of Massachusetts.
BEYOND MAN'S GENETIC LOTTERY, Dr. James Bonner, Prof. of Biology, California Institute of Technology;
ENDING MAN'S ISOLATION IN THE UNIVERSE, Dr. Bernard Oliver, Vice President for Research, Hewlett-Packard Corp.
THE NEXT BILLION YEARS STARTS NOW, Lord Ritchie-Calder, Senior Fellow, Center for the Study of Democratic Institutions;
MAN, THE PLANETS AND THE FUTURE--An Epilogue, Dr. Bruce Murray, Prof. of Planetary Science, California Institute of Technology.

For information about enrolling in the CSU/SJ or SF credit courses, call the Office of Continuing Education at the appropriate State University.

NASA Administrator

(Continued from Page 1)

ents, of Dr. Fletcher's staff, flew in the Flight Simulator for Advanced Aircraft (FSAA); the simulator was programmed to fly like a DC-9 modified for VTOL. Ames pilot George Cooper flew the simulator.

The Pioneer Venus status was reported to Dr. Fletcher by John Foseter, Director of Development, Charles Hall, Pioneer Project Manager, and Robert Nunamaker, Pioneer Venus Study Team Leader. The Pioneer Venus Mission is currently in a conceptual design stage with the hope that it will become an approved program during FY 1975 leading to Venus orbiter and multiprobe launches in 1978.

Dr. Fletcher said the Venus Programs has been a very high priority mission among scientists, particularly planetary scientists for a number of years and it is also extremely important to NASA from the scientific view. He emphasized the need to control costs within NASA and discussed a number of ways that NASA was looking at to make the Pioneer Venus a cost-effective program. He emphasized NASA's intention of proceeding with the missions if at all possible and the intent to make it one of NASA's most cost-effective programs.

Toastmasters

The Early Risers Toastmasters Club of Palo Alto, aptly named because the group meets at 6:30 a.m., will hold a special meeting at the Ames Cafeteria on Wednesday morning, July 11. The Cafeteria was selected as a meeting place because it is located on government property. This enable the Toastmasters to invite female members of the Ames staff to join them for this special meeting. For more information, call Shel Smith, ext. 6330.

"Thank you"

To all my friends at Ames:

Thank you for the marvelous retirement luncheon and great gift.

Having lunch with all of you was one of the highlights of my life.

Thanks a million,

Max and Lillian Strauss

astrogram

Room 142
Admin. Mgt. Building
Phone 965-5422

The Astrogram is an official publication of the Ames Research Center, National Aeronautics and Space Administration, Moffett Field, California, and is published bi-weekly in the interest of Ames employees.

Editor . . . . . Meredith Moore
Reporters . . . . . NASA Employees

Deadline for contributions:
Thursday between publication dates

LARRY KING . . . of Ames Public Affairs Office, has been Senior Public Affairs Officer on many space recovery missions.

Recoveries

(Continued from Page 1)

procedure has evolved from the first mission with the total dedication of twenty-two ships, to the present Skylab mission where only one ship is totally dedicated.

King and two others try to educate the press corps. They help the Navy and NASA in relationship with press. By splashdown time, the press should know the names of the helicopter pilots, swimmers and how and what they are doing.

Skylab recovery, King points out, will differ somewhat from previous recoveries. Spacecraft, astronauts and all will be picked up by the recovery ship if all goes as planned.

After splashdown, a helicopter from the USS Ticonderoga will drop swimmers around the spacecraft who will attach a flotation collar for stabilization. The Ticonderoga will then maneuver alongside the modified Apollo spacecraft and will lift it to the ship's hangar deck using a boat and aircraft crane.

The three astronauts (Charles "Pete" Conrad, Jr., Joseph P. Kerwin, and Paul J. Weitz) will exit the spacecraft and proceed to the Skylab Mobile Laboratories for extensive tests and examinations.

The astronauts themselves are considered very important biomedical data and every effort will be made to prevent them from reconditioning their physiology from that of zero gravity to a 1-G environment.

Aboard the returning spacecraft will be blood samples, frozen urine, freeze dried feces, and certain experimental data which will require speedy transfer to storage facilities on the recovery ship. If the spacecraft were opened on the surface of the water to retrieve the astronauts there is the chance that these sample and experimental data, even though packaged very tightly, might be damaged by the warm, moist sea air filling the spacecraft.

According to King, a formal ceremony will be held in San Diego, but not on the ship at sea. In San Diego, the astronauts will transfer to a C-141 and fly to JSC where doctors will examine their physical condition.

In a recent interview King recollected, "The best moment that I had on one of the recovery missions came during the Apollo 13 mission. When the guys came back, we didn't know what was going to happen. Then, when we saw those parachutes open and saw the guys so obviously happy, all was well.

"I was in charge of communications with the press then and when the problem first developed it was very bad. We went through several days with other ships offering help in picking up the astronauts. We were uncertain as to where the recovery point would be, or just what the astronauts would do, i.e., circling the Moon or not. It was a very busy few days.

"The recovery itself is a tremendous management accomplishment. There is so much that must be provided for the recovery team and the recovery itself. For instance, any medical facilities needed must be available. It takes a

"The recovery itself is a tremendous management accomplishment. The Navy does a fantastic job. With two flights a year it has been quite a burden on the Navy, but they have come through every time. It takes a large crew to provide all the facilities needed in an efficient manner. What people see on TV is a very small part of what actually goes on.

"Usually we've been at sea for three or four weeks prior to splashdown time, simulating full recovery procedures daily. Less time will be spent at sea with the recovery of the Skylab astronauts---mainly because of their splashdown position. We expect to spend twelve or thirteen days on the Ticonderoga, which, by the way, served as the recovery ship for Apollo 16 and 17 missions. Skylab recovery mission will be the Ticonderoga's last cruise."

The news pool ends when the astronauts leave the ship.

King reminisces, "It's sure been interesting; I've probably put in as many, if not more, hours at sea than any sailor. And I've expecially enjoyed the Tropics where many mission recoveries have been."

King is a sea buff. He has lived near the ocean most of his adult life and enjoys sailing. He owns a sailboat (sloop) and someday, he and his wife, Ann, hope to live aboard a sailboat.

EEO Complaints Process

The current Equal Employment Opportunity (EEO) Complaints Process was established by the passage of Public Law 92-261, more commonly known as the EEO Act of 1972.

This Process, regulated by the Civil Service Commission, significantly expedites the impartial hearing of allegations of denial of employment opportunities for such non-merit reasons as race, color religion, sex, and national origin.

By law, complainants, their representatives, and witnesses shall be free from restraint, interference, coercion, discrimination, or reprisal at any stage of the presentation and processing of complaint, including the counseling stage, or anytime thereafter.

Any Ames' employee or applicant for employment who feels he/she have been denied equal employment opportunity may discuss the problem in confidence with one of the EEO counselors or other designated EEO Official. However, such contact must be initiated within 30 calendar days of the alleged discriminatory act. The counselor will act to informally resolve the problem within 21 calendar days from the time of initial contact.

If no satisfactory adjustment of the problem can be arrived at, the complaintant, at a final interview, is informed of his/her right to file a formal written complaint addressed tothe EEO Officer or the Center Director within 15 calendar days after the final informal interview. Employees cannot be restrained or coerced from filing such formal complaints,which if filed,is acknowledged and forwarded to the NASA Director of EEO who initiates action.

EDITOR'S NOTE:

This is the first article of a series on the EEO Complaints Process.

Biologist to coordinate research

Dr. Ellen C. Weaver, pictured above, is an Ames contract employee from California State University, San Jose, and has been named acting director of the University's Center for Research and Advanced Studies (CRAS) by University President John H. Bunzel.

The appointment became effective June 1. As head of CRAS, Dr. Weaver will coordinate all campus research funded by both public and private agencies.

An associate professor of biology, Dr. Weaver has done much research on photosynthesis---the process by which plants use chlorophyll to convert solar energy to carbohydrates for food.

Along with Ames research scientists John C. Arveson and John P. Millard of Planetary and Science Application Branch, Dr. Weaver is devising a highly sensitive monitoring device to measure the subtle and subliminal changes in the chlorophyll content of water. More advanced versions of the device could be put aboard satellites to make continuous global checks on food production capacity and pollution levels of the seas.

A member of several professional and honorary societies, she is presently membership chairman of the newly formed Association of Women in Science, an international organization.

Brochure available

Copies of a brochure entitled "Most Asked Questions About Space and Aeronautics" are available upon written request from the NASA Audio-Visual Facility, c/o Public Affairs Office, Mail Stop 204-12. Indicate the number requested and give name and mail stop.

"Ames Airings"

. . . by Meredith Moore

HOT SUMMER WEATHER prompts most Ames employees and contractors to plan vacations early. Here are just a few examples of energetic outtings scheduled on the Ames summer calendar so far:

Bicycling around Lake Tahoe with a 50-pound pack (some of us require more "equipment" than others) last week was BOB PIKE, Chief of the Personnel Division. Bob, with a group of friends on 10-speed bicycles, began the trip at Tahoe City, proceeded to Emerald Bay, Fallen Leaf Lake, Meyers and Markleeville; they then rode to the quaint town of Minden in Nevada, over to Carson City and back to the northshore of Lake Tahoe. The entire tour was scheduled to last four days. A little trout fishing was also to be squeezed in if the group remained enthusiastic enough to haul their bikes up to a lake at the 8,000' elevation. Good luck, guys, and we trust you all remembered your fishing licenses! And here's hoping that few flat tires were experienced during the four days.

PAUL BENNETT, Chief of Graphics and Exhibits Branch, and JACK CONNOLLY, Electro-Systems Engineering Branch, plan to float the Grand Canyon in life rafts for ten days during September. Paul said, "We are going with a company called Grand Canyon Expeditions. We have no idea how many people will be in the group but we imagine it will be a good sized party with lots of adventure in store. I've never done this before so its bound to be adventuresome! We begin at Lees Ferry---wherever that is---and float to Lake Mead. The actual trip costs cover round trip from Las Vegas, Nevada where we first meet the group. We're really looking forward to it." Have fun "floating"---or is it "rushing"?---the rapids, you two!

RETURNING TO EUROPE for two months this summer is contract employee CHRIS HONDAGNEU from the Badge Office. Chris is traveling to Europe with two girl friends. She, if you haven't guessed by now, is of French descent. The three girls plan to spend their time in Spain and France. They will arrive in Madrid first and then travel up to the Basque country around the Pyrennes Mountains to attend a wedding (relative of Chris). The three will return to Spain to visit Barcelona, Pamplona ("Running of the Bulls" in July) and ultimately to look for jobs which may not be an easy task. Chris says, "We all have return tickets if the money gets tight and we can't land a job. But until then, we hope to see a lot of country and have a lot of fun!"

Leaving vacations behind for the moment, congratulations are in order for JULIE LETARTE of Records Management Branch. Julie is being married Saturday, June 23, to Tom Jansson in the Los Altos Lutheran Church. Today, Julie was honored at a surprise luncheon given by the Branch at the Bold Knight in Sunnyvale. Best wishes, Julie.

CONGRATULATIONS are also in store for CARROLL ANN ERICKSON, formerly of the Chief Counsel's Office, and husband Gerald, because on May 20, Carroll Ann gave birth to son Michael, 8 lbs. 12 oz.

And last but certainly not least, sincere wishes for a speedy recovery are extended to CARDY MACON, of Records Management Branch, who is now home from the hospital and doing well.

Bond Drive

Early returns indicate that there is strong support for Ames' 1973 U. S. Savings Bond Drive. The Center's percentage increased to 57.4% and more participation is expected.

Lewis Hughes, Chief of Health and Safety Office, and Coordinator of Ames' Bond Campaign this year, wants to thank all the new purchasers as well as the coordinators for each directorate and division and also the many canvasers.

Dr. Hughes said, "If anyone feels left out, there is still time to sign up for purchasing Savings Bonds."

Series E Bond holders may exchange their Bonds at current redemption values for current-income H Bonds. The Bond submitted in exchange must have a current redemption value of $500 or more. H Bonds pay 5 1/2% interest semi-annually by Treasury check.

AN EAGLE FOR LT. COLONELS . . . Colonel Demos Kyrazis (l.) and Colonel Richard E. Kahler (r.) were both promoted from Lieutenant Colonel to full Colonel effective May 1. As a result of the promotion, Colonel Kryazis has been reassigned to the Air Force Weapons Laboratory at Kirtland AFB, New Mexico and Colonel Kahler has been reassigned to the Office of Science and Technology Headquarters Air Force Systems Command, Andrews AFB, Maryland.

Ames Jet Setters

The next activity meeting will be Wednesday, June 27, in the Space Sciences Auditorium, Bldg. 245, from 7:30 to 9 p. m. There will be a movie, question and answer period for the 8 days and 7 nights trip to Mexico City, Taxco and Accapolco trip in late November.

Don't miss it; come and sign up!

Photography Club

The Ames Photography Club's year-end meeting will be at the Golden Pavilion Restaurant in Los Altos on Thursday, June 28 at 7 p.m.

Call Guy Wong (6022) for dinner reservations by Monday, June 25.

SOFTBALL

Bob Corbett just missed pitching a perfect game by walking one batter in the San Jose Fastpitch League. He struck out 12 batters in a 1 to 0 win over Rodriquez Roofing. Ames pushed across the only run of the game in the last inning. Ganzler opened up the inning with a base hit and moved to third on two infield outs. Corbett then won his own ballgame with a hit up the middle scoring Ganzler from third.

WANT ADS (Continued)

NEEDED:

One driver for car pool from Valco Park Area, 7:30 - 4 p.m. shift, 248-0427 eves.

WANT ADS

TRANSPORTATION

"Open Road" Motor Home, 25 ft., $3500 and take over payments, 258-6422.

---

65 Olds Cuttles, in very good cond., $995/offer, Jacob Shapira, 965-3653.

---

71 MGB Roadster, like new, trade for late model small car, or sell, $2095, Bob McCracken, 578-2676.

Siesta Telescopic Camper, 8 1/2 ft., stove, ice box, bed, table, overhead storage $750., C. Struckman, 734-4965.

HOUSING

Westgate, Campbell, 4 bdrm. 2 ba., refurbished, w/w carpet, drapes, AEK, dish., refurb., ideal for children, $31,500, Hruby, 379-4809.

Pleasant Hills gold course San Jose, 4 bdrm. 2 1/2 ba., 2100 sq.ft., two-story, $36,000, 238-0129.

Summer home rental, South Shore Tahoe, 3 bdrm. 1 1/2 ba., w/w carpet, AEK, Sun deck, $150/wk., $75/weekend, Kirwan, 796-9433.

N. Tahoe cottage near lake and private beach area, 984-7238 or 354-1050 eve. 277-2369 days.

MISCELLANEOUS

Encore receiver, BSR turntable, two teak acoustic speakers, $120, call 263-2993, Peter, 12:30 - 5:30 p.m.

Early American dining rm. furn., table, 6 chairs & hutch, $225, 948-1627.

Pool-table $160; hide-a-bed 65" $60; kitchen table, 2 chairs, $15; hedge trimmer, Skill, $10; grass trimmer, Black & Decker, $6.50; chair, $15, 243-9970.

FREE

Kittens, very cute & young, personality plus, contact M. Moore, 948-7984.

90000 BTU Updraft furnace, natural gas, 1 year old. Bob McCracken, 578-2676.

Dog barrier for station wagon, all crome, adjustable $20, 738-3689.

RIDE NEEDED:

From corner of Rinconada Park vicinity (Embarcadero & Middlefield) Mon. thru Fri., 8-4:30 p.m. start June 25, 327-8481.

WANTED:

Responsible female to share neat apt. in Cupertino, $80 mo., 10 min. from Ames, x5514.